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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,330	06/14/2002	Harald Roessler	H 4024 PCT/US	3683

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COGNIS CORPORATION  
PATENT DEPARTMENT  
300 BROOKSIDE AVENUE  
AMBLER, PA 19002

EXAMINER

PUTTLITZ, KARL J

ART UNIT	PAPER NUMBER
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1621

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/049,330	<b>Applicant(s)</b> ROESSLER ET AL.	
	<b>Examiner</b> Karl J. Puttlitz	<b>Art Unit</b> 1621	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-35 is/are pending in the application.
- 4a) Of the above claim(s) 31-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/14/2002</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Applicant's election with traverse of Group I, claims 10-30 is acknowledged. The traversal is on the ground(s) that all of the pending claims relate to a single inventive concept under PCT Rule 13.1, namely the production of esters of unsaturated carboxylic acids and polyhydric alcohols, and thus, the Examiner must consider each inventions as a whole with respect to "special technical features".

This is not found persuasive because unity exists when there is a technical relationship among the claimed inventions involving one or more corresponding special technical features. A special technical feature is a contribution which each of the inventions, considered as a whole, makes over the prior art. See M.P.E.P Appendix AI, § 206 and Annex B.

Here, the restricted groups lack unity since the alleged special technical features of Group I, i.e., steps of the claimed methods do not correspond with those alleged special technical features of Group II, i.e, the elements of the apparatus of claims 31-35.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 15 and 16 recite those embodiments wherein a third polymerization inhibitor is introduced into the reaction zone such that a portion of the inner surface of the reaction zone which is not in contact with the reaction mixture is contacted with the third polymerization inhibitor. However, the claim is indefinite because it is unclear how the reaction mixture will come to contain the polymerization inhibitor if the surface of the reaction zone which is not in contact with the reaction mixture is contacted with the third polymerization inhibitor.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-30 are rejected under 35 U.S.C. 103(a) as obvious over EP 916 643, as evidenced by counterpart U.S. patent No. 6,506,930 to Venter et al. (Venter) in view of U.S. Patent No. 5,322,960 to Sakamoto et al. (Sakamoto).

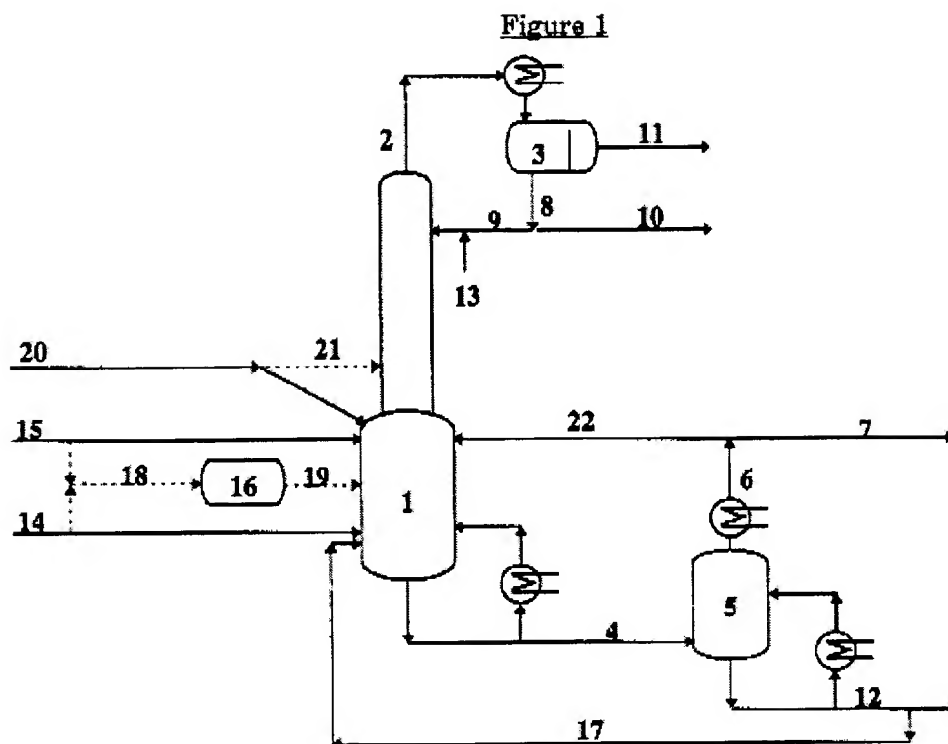
The claimed invention is drawn to, *inter alia*, a process for producing esters, said process comprising: (a) providing a liquid reaction mixture comprising (i) an unsaturated carboxylic acid having a boiling point greater than water, (ii) a polyhydric alcohol, and (iii) a first polymerization inhibitor, in a reaction zone having an inner surface; (b) reading the acid and the polyhydric alcohol to form an ester, such that a vapor phase is formed comprising water of reaction; (c) removing at least a portion of the vapor phase

Art Unit: 1621

from the reaction zone to a dephlegmation zone having an inner surface; (d) partially condensing the portion of the vapor phase in the dephlegmation zone such that a condensate is formed; and (e) returning the condensate to the reaction zone; wherein a second polymerization inhibitor is introduced into the dephlegmation zone such that the portion of the vapor and/or the condensate are contacted with the second polymerization inhibitor.

Venter teaches a process which includes: (A) charging a reactor with an alcohol, a (meth)acrylic acid, a strong acid catalyst, and at least 5% by weight water to form a reaction mixture; (B) reacting the reaction mixture to form an alkyl (meth)acrylate and process impurities, wherein the process impurities formed are hydrolyzed in the reactor; and (C) separating the alkyl (meth)acrylate and water formed during the reaction from the reaction mixture. See column 2, lines 11-21.

Venter specifically describes the process with reference to Fig. 1.:



wherein, FIG. 1 illustrates the equipment and the flow lines utilized in one embodiment of the process of the present invention, including the direct esterification/hydrolysis reactor 1 which is a stirred reactor having a distillation column on top of it; line 2, which carries a vaporized distillate mixture, which includes BA, from 1 to a phase separator 3, the phase separator 3 separates the vaporized distillate into a BA rich organic phase and an aqueous distillate phase; line 11, which carries the BA rich organic distillate separated in 3 forward to a separation section; line 8 which carries the aqueous distillate separated in 3 to line 9 to be recycled to 1, and to line 10 to carry

Art Unit: 1621

it forward to be treated, generally to recover material from aqueous waste; line 4, which carries the AA rich bottoms from 1 to bleed stripper 5, which is the cracking reactor; line 6, which carries the distillate, including recovered BuOH and AA from 5 to be recycled to 1 through line 22, and to line 7 which carries the distillate from 5 forward to be treated, generally as waste; line 12, which carries the bottoms from 5 forward to be treated, generally as waste and optionally to line 17, which recycles bottoms from 5 to 1; line 13, which may feed inhibitor to the reactor; line 14, which feeds catalyst to the reactor; line 15, which feeds fresh AA and BuOH to the reactor; an optional plug flow reactor 16; an optional line 18 for feeding AA, BuOH, and catalyst to 16; an optional line 19 for taking the material from 16 to 1; line 20, which carries the BuOH, BA, and AA recovered in the separation section from lines 10 and 11 back to the reactor 1; and optional line 21 which returns recovered material to an alternative feed location in reactor 1. See paragraph bridging columns 2 and 3.

At least one inhibitor may also be charged to the reactor in step (A).

In a preferred embodiment, the distillation column may be situated directly on top of the reactor (as in FIG. 1) and may be a fractional distillation column. Generally, the distillation column contains from 20 to 100 trays. It is preferred that the column contains from 20 to 70 trays. It is more preferred that the column contains from 40 to 50 trays. The column has means for feeding AA, BuOH, a strong acid catalyst, water, and at least one inhibitor. See column 4, lines 21-39.

Venter fails to explicitly disclose the use of a third polymerization inhibitor.

However, Venter discloses that an inhibitor is used in the reactor and in the distillation

Art Unit: 1621

column, supra. Therefore, one of ordinary skill would expect that a polymerization in contact with the surface of the reactor would be a necessary aspect of the process disclosed in Venter, and therefore, would be within the motivation of those of ordinary skill.

Alternatively, Sakamoto teaches a method for inhibiting the polymerization of (meth)acrylic acid monomers and (meth)acrylate monomers. Specifically, this patent teaches that an N-oxyle compound, phenol compound, and phenothiazine compound, produce a pronounced inhibiting effect while they are used in combination with one another. See column 2, lines 46-54.

One of ordinary skill would have been motivated to modify the Venter reference to include three inhibitors in a process for producing esters of unsaturated carboxylic acids since Sakamoto teaches that using three polymerization inhibitors in combination produces the best inhibiting effects. Therefore the combination of Venter and Sakamoto renders the claims prima facie obvious since these references teach all the aspects of the claimed invention with a reasonable expectation of success.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday-Friday (alternate).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on (571) 272-0646.



Art Unit: 1621

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1235.

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